

**WHAT IS CLAIMED IS:**

1. A plasma generation apparatus, comprising:
  - a power supply circuit having a cathode enclosed in a chamber, and adapted to generate a power-related parameter; and
    - an arc detection arrangement communicatively coupled to the power supply circuit and adapted to assess the severity of arcing in the chamber by comparing the power-related parameter to at least one threshold.
2. The apparatus of claim 1, wherein the arc detection arrangement is further adapted to measure arcing duration responsive to comparing the power-related parameter to the at least one threshold.
3. The apparatus of claim 1, wherein the arc detection arrangement is further adapted to measure cumulative arcing duration responsive to comparing the power-related parameter to at least one threshold.
4. The apparatus of claim 1, wherein the arc detection arrangement is further adapted to measure arcing intensity responsive to comparing the power-related parameter to at least one threshold.
5. The apparatus of claim 4, wherein the arc detection arrangement is further adapted to measure arcing duration responsive to comparing the power-related parameter to at least one threshold.
6. The apparatus of claim 5, wherein the arc detection arrangement is further adapted to measure arcing energy responsive to comparing the power-related parameter to at least one threshold.

7. The apparatus of claim 5, wherein the arc detection arrangement is further adapted to measure cumulative arcing energy responsive to comparing the power-related parameter to at least one threshold.
8. The apparatus of claim 1, wherein the arc detection arrangement is further adapted to assess the severity of arcing as a function of a product of arcing intensity and arcing duration.
9. The apparatus of claim 1, wherein the arc detection arrangement is further adapted to assess the severity of arcing as a function of a sum of products of arcing intensity and arcing duration.
10. The apparatus of claim 1, wherein at least one threshold is programmable via a logic arrangement coupled to the arc detection arrangement.
11. The apparatus of claim 1, wherein at least one threshold is programmable responsive to a non-arcing value of the power-related parameter.
12. The apparatus of claim 1, wherein the arc detection arrangement is adapted to digitize the power-related parameter before comparing to the at least one threshold.
13. The apparatus of claim 1, further comprising a logic arrangement communicatively coupled to the arc detection arrangement, and adapted to process digital information representative of arcing transmitted from the arc detection arrangement.
14. The apparatus of claim 13, wherein the logic arrangement is a programmable logic controller.

15. An apparatus for assess arcing severity in a plasma generation chamber, comprising:

means for determining arc intensity by comparing a power-related parameter to at least one arc intensity threshold;

means for timing an arc duration responsive to comparing the power-related parameter to the at least one arc intensity threshold;

means for computing arc energy as a function of arc intensity and arc duration; and

means for adding the arc energy to an accumulated arcing energy.